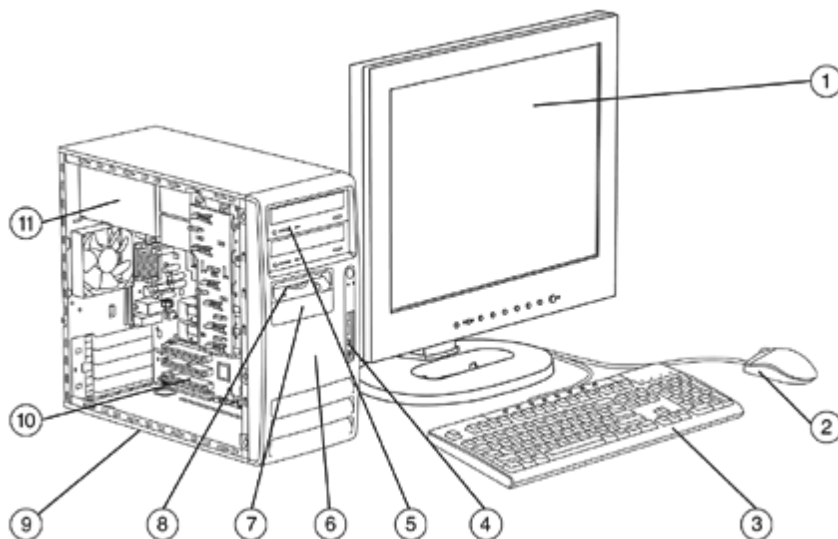


Overview

Microtower

36.8 x 17.5 x 41.4 centimeters/14.5 x 6.88 x 16.31 inches



- | | |
|--|---|
| 1. Monitor Sold Separately | 6. 2 Internal 3.5" Drive Bays with 1 Ultra ATA/100 Hard Drive |
| 2. 2-Button Scroll Mouse | 7. 2 External 3.5" Drive Bays |
| 3. Easy Access Keyboard | 8. Optional 1.44-MB Diskette Drive |
| 4. 2 USB 2.0 Headphone and Microphone | 9. Tool-less drive bays and system board |
| 5. 2 External 5.25" Drive bays for CD-ROM, DVD-ROM, CD-RW or Combo Drive | 10. 3 full-height PCI slots and 1 8X AGP slot |
| | 11. 240-Watt Power Supply |

At A Glance

- AMD Athlon™ XP processors
- Choice of operating systems:
 - Genuine Microsoft Windows XP Home SP1
 - Genuine Microsoft Windows 2000 SP3
 - Genuine Microsoft Windows XP Professional SP1
- NVIDIA nForce2 GT chipset with Integrated 64-MB NVIDIA GeForce4 MX Graphics
- Integrated dual-monitor VGA connections built in with NVIDIA nView Multi-display software standard
- Supports up to 2-GB of PC 2700 (DDR 333) Synch DRAM Memory
- Dual channel memory support
- 4 rear USB 2.0 ports and 2 front USB 2.0 ports
- Integrated audio with internal speaker
- Integrated 3COM 10/100 NICLOM (Lan on Motherboard)
- 8X AGP slot
- Energy Star compliant with energy-saving features
- Protected by HP Services. Terms and conditions vary by country. Certain restrictions and exclusions apply.

Standard Features - Select Models (localized by Regions)

Model Key
Example:

Pre-Configured Models

Standard Features - Custom Components

Processor and Speed – One of the following	AMD Athlon Processors	Front Side Bus	Standard L2 Cache
	AMD Athlon XP 2600+ (2.13-GHz)	266-MHz	256-KB ECC
	AMD Athlon XP 2400+ (2.00-GHz)	266-MHz	256-KB ECC
	AMD Athlon XP 2200+ (1.80-GHz)	266-MHz	256-KB ECC
	AMD Athlon XP 2800+ (2.08-GHz)	333-MHz	256-KB ECC
	AMD Athlon XP 3000+ (2.17-GHz)	333-MHz	256-KB ECC

Operating System – One of the following	Genuine Microsoft Windows XP Home SP1
	Genuine Microsoft Windows 2000 SP3
	Genuine Microsoft Windows XP Professional SP1

Hard Drives	40-GB 7200 rpm SMART III Ultra ATA/100
	40-GB 5400 rpm SMART III Ultra ATA/100
	80-GB 7200 rpm SMART III Ultra ATA/100
	80-GB 5400 rpm SMART III Ultra ATA/100
	160-GB 7200 rpm SMART III Ultra ATA/100

Standard Memory – One of the following	128-MB DDR Synch DRAM PC2100 (266-MHz) Non ECC (1 x 128 DIMM)
	256-MB DDR Synch DRAM PC2100 (266-MHz) Non ECC (1 x 256 DIMM)
	512-MB DDR Synch DRAM PC2100 (266-MHz) Non ECC (1 x 512 DIMM)
	128-MB DDR Synch DRAM PC2700 (333-MHz) Non ECC (1 x 128 DIMM)
	256-MB DDR Synch DRAM PC2700 (333-MHz) Non ECC (1 x 256 DIMM)
	256-MB DDR Synch DRAM PC2700 (333-MHz) Non ECC (2 x 128 DIMM)
	512-MB DDR Synch DRAM PC2700 (333-MHz) Non ECC (1 x 512 DIMM)
	512-MB DDR Synch DRAM PC2700 (333-MHz) Non ECC (2 x 256 DIMM)
	1-GB DDR Synch DRAM PC2700 (333-MHz) Non ECC (2 x 512 DIMM)

Removable Storage	Optional 1.44-MB Diskette Drive
	Zip 250 Drive (available in 3.5" and 5.25")
	16-MB, 64-MB, or 128-MB Drive Keys

Optical Storage – One of the following	48X Max CD-ROM Drive
	52X Max CD-ROM Drive (Asia only)
	48X/24X/48X CD-RW Drive
	16X/40X DVD-ROM with +R Read
	48X Combo CD-RW/DVD-ROM Drive
	4X DVD+R/RW Drive
	NOTE: All DVD devices will be restricted to 256-MB or more system memory.

Standard Features - Custom Components

Keyboard	PS/2 Easy Access Keyboard
	USB Easy Access Keyboard
	USB Smartcard Keyboard

Mouse	PS/2 2-Button Scroll Mouse
	USB Optical Scroll Mouse
	Wireless Optical Mouse

Modem	Lucent 56K Win Modem
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Audio	Integrated Soundmax AC97 audio with premium internal speaker
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NIC	Integrated 3Com 3C920B-EMB Fast Ethernet Controller
	Intel Pro 1000 MT NIC FH PCI adapter
	Broadcom NetXtreme Gigabit ethernet NIC

Graphics	NVIDIA nForce2 GT chipset with Integrated NVIDIA GeForce4 MX 64-MB Graphics
	NVIDIA Quadro4 100 NVS 64MB DDR FH AGP dual head VGA
	NVIDIA GeForce4 MX-440-8 64MB DDR FH 8X AGP VGA w/TV-out

Software (Microsoft Windows system only)	Norton Antivirus 2005 with 60 day Live Update Subscription
	Microsoft Works 2003 (US only)
	Microsoft Office XP Small Business Edition (select languages)
	Microsoft Office XP Professional (select languages)
	Roxio EZ CD Creator 5.3 (included with all re-writeable optical drives)
	CorelWordPerfect (US English only) (on CD)
	Intervideo WinDVD (included with all DVD drives)
	MyDVD Suite (included on CD with all DVD +R/+RW drives)
	HP Restore Plus! Kit / OS CD
	Dantz Restrospect Backup (included on CD with all re-writeable optical drives)
	Open Office Productivity Suite on CD (LA only)

Intelligent Manageability	Downloadable from HP Intelligent Manageability at: http://h18000.www1.hp.com/im/
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Standard Features - Base Unit Details

Base Unit Contents

Chassis
 AMD processor, heatsink
 System board with NVIDIA nForce2 GT chipset
 (2) ATA Cables
 Optional diskette drive with cable
 Audio cable
 Quick Setup Poster
 Product Documentation on CD
 HP OS CD and HP Restore CD
 Warranty card
 Power Cord
 PS/2 Easy Access Keyboard
 PS/2 Scroll Mouse or USB Optical Mouse (North America)

Supported Operating Systems

DOS	No
Windows 3.1	No
Windows 95	No
Windows 98	No
Windows NT 4.X	No
Windows 2000 / Windows XP Professional dual-install	No
Windows 2000	Yes
Windows XP Professional	Yes
Windows XP Home	Yes
Mandrake Linux 9.1	Yes

Expansion Capability

Memory Expansion Slots (Non-ECC)	2 DIMM slots
Maximum Memory	2-GB (1-GB per slot maximum)

Bays

Total Bays =	6
Internal	(2) 3.5-inch hard drive bays
External	(2) full-length 5.25-inch
	(2) full-length 3.5-inch

Slots

PCI	3 full-height, full-length
AGP	1 full-height, full length 8X AGP

Wireless Support

PCI card or external USB

Standard Features - Base Unit Details

USB Support	(2) Front USB 2.0 Ports
	(4) Rear USB 2.0 Ports

NOTE: 2 USB ports can be high-speed, (USB 2.0), and divide the total possible 480Mb/s bandwidth. The remaining 4 ports, if used at the same time, are USB 1.1 and divide up a total of 12Mb/s between them.

Interfaces (Legacy)	Parallel Port	1
	Serial Port	1
	PS/2 Keyboard	1
	PS/2 Mouse	1
	VGA Adapter	2

Chassis Dimensions (H x W x D)	14.5 x 6.88 x 16.31 in (36.8 x 17.5 x 41.4 cm)
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Chassis Weight	System Weight	23.8 lb (10.92 kg)
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Packaged Unit Dimensions (H x W x D)	23.5 x 13.0 x 23.2 in (60 x 33.02 x 59 cm)
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Packaged Unit Weight	32.5 lb (14.71 kg)
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System Memory	Type/Speed	DDR Synch DRAM PC2700 (333-MHz) Non-ECC and DDR Synch DRAM PC2100 (266-MHz) Non-ECC
	Maximum Memory	2 GB (1 GB per slot maximum)
	Memory Parity	Not Needed for non-ECC
	ECC Memory	Not Supported by chipset
	Serial Presence Detect Support	Supported
	Dual channel memory Support	Yes. Requires two equal size and type memory modules

Supported Features	Processor	AMD Athlon XP
	CPU Bus Speed Supported	333 or 266-MHz FSB
	Memory Type Supported	DDR (ECC not supported by Chipset)
	Memory Speed Supported	DDR Synch DRAM PC2700 (333 MHz) or PC2100 (266-MHz) Non-ECC
	Serial Presence Detect Support	Yes
	Hard Drive Interfaces Supported	SMART III Ultra ATA/100/66/33
	Hard Drive Controller (PCI)	SMART III Ultra ATA/100/66/33
	Supported	

Standard Features - Base Unit Details

AMD Athlon XP	Coprocessor	Integrated
	CPU Socket Type/Number	Socket A
	CPU Package	FC-PGA
	Front Side Bus Speed	333 or 266-MHz
	Standard L2 Cache	512-KB ECC or 256-KB ECC, depending on processor
	L2 Cache Architecture / Speed	Full core clock speed
	Cache Upgradeable To	Not upgradeable - Integrated into Processor

System Board	Architecture	Athlon XP / PCI / AGP 4X and 8X
	Chipset	NVIDIA nForce2 GT chipset
	I/O Controller	SMSC LPC47B367 Super I/O
	System Board Form Factor	Standard uATX
	Processor Socket - 462 Pin ZIF	Yes
	DIMM Connectors (2.5V)	Yes (2)
	AGP Connector (1.5V)	Yes (1) 8X AGP
	Integrated AGP Graphics	Yes
	PCI Connectors	Yes (3 on system board)
	Flash ROM	Yes
	Audio	Yes
	CD ROM IN (Audio)	Yes
	Clear CMOS	Yes
	CPU Fan Header	Yes
	Chassis Fan Header	Yes
	CMOS Battery Holder - Lithium	Yes
	Hood Lock Header	Yes
	Hood Sense Header	Yes
	Multibay Header	No
	Multport Header	No
	NIC supported features:	
	WOL (Wake-On-Lan®)	Yes
	AOL (Alert-On-LAN®)	No
	SOS - Network based alerting	Yes
	ASF (Alert Standards Format)	No
	PXE (Pre-Boot Execution Environment)	Yes
	Power Supply Header	Yes
	Power Switch, Power LED & Hard Drive LED Header	Yes
	Password Clear Header	Yes
	Riser Connector	No
	SCSI LED Header	No

Standard Features - Base Unit Details

	ACPI-Ready Hardware	- Advanced Configuration and Power Management Interface (ACPI). - It allows the system to wake from a low power mode. - It controls system power consumption, making it possible to place individual cards and peripherals in a low-power or powered-off state without affecting other elements of the system	Yes
	Dual-State Power Button	Power button acts as both an on/off button and suspend-to-sleep button	Yes
Chassis	Color	Carbonite/Silver	
	System Board Form Factors Supported	Standard uATX	
	Cooling Solutions Supported		
	Power Supply Fan (Variable Speed)	Yes	
	Processor Fan-Heatsink (Variable Speed)	Yes	
	Chassis Fan	Yes	
	Front I/O	Standard Front Headphone, Microphone, and (2) USB 2.0	
	Rear I/O	Standard ATX I/O Connectors (4 USB 2.0, 1 VGA, 1 Audio Out, 1 Audio In, 1 Microphone, 1 Serial, 1 Parallel, 2 PS2, 1 RJ-45)	
	Internal Speaker	Yes	
	Security Locks Supported	Kensington Cable Lock (optional) Hood Cover Security Loop (standard but Lock not included) Solenoid Hood lock (optional)	

Standard Features - Base Unit Details

Unit Environment and Operating Conditions	General Unit Operating Guidelines	
	- Keep the computer away from excessive moisture, direct moisture and the extremes of heat and cold, to ensure that unit is operated within the specified operating range. - Leave a 10.2 cm (4 in) clearance on all vented sides of the computer to permit the required airflow. - Never restrict airflow into the computer by blocking any vents or air intakes. - Do not stack computers on top of each other or place computers so near each other that they are subject to each other's re-circulated or preheated air. - Occasionally clean the air vents on the front, back, and any other vented side of the computer. Lint, dust and other foreign matter can block the vents and limit the airflow. - If the computer is to be operated within a separate enclosure, intake and exhaust ventilation must be provided on the enclosure, and the same operating guidelines listed above will still apply.	
Temperature Range	Operating Temperature:	50° to 95° F (10° to 35° C)
	Non-operating Temperature:	22° to 140° F (30° to 60° C)
Relative Humidity	Operating Humidity	10% to 90% (non-condensing at ambient)
	Non-operating Humidity	5% to 95% (non-condensing at ambient)
Maximum Altitude (unpressurized)	10,000 ft (3048 m)	30,000 ft (9144 m)

NOTE: Operating temperature is de-rated 1.0 deg C per 300 m (1000 ft) to 3000 m (10,000 ft) above sea level, no direct sustained sunlight. Maximum rate of change is 10 deg C/Hr. The upper limit may be limited by the type and number of options installed.

Interfaces	I/O Chip	SMSC LPC47B367 Super I/O
	Serial Port / UART Type	One Serial Port
	Parallel Port	One Parallel Port
	USB	6 USB 2.0 ports (4 rear/2 front)
	Infrared Port	No
	Network	RJ-45
	Keyboard	Yes (PS2 and USB)
	Mouse	Yes (PS2 and USB)
	Multibay	No
	Video	Yes
	Audio	Yes

Standard Features - Base Unit Details

Power Supply	Power Supply	240-watt ATX power supply - PFC 115v/230v line switch
	Full Ranging Input (No Line Select Switch)	No
	Active Power Factor Correction (APFC) (Input Current is nearly 1/2 a non-APFC PS)	No
	Passive Power Factor Correction (PFC)	Yes (with line switch set to 230V - No PFC in 115V line switch position)
	Operating Voltage Range	90 to 132 VAC, or 180 to 264 VAC
	Rated Voltage Range	100 to 127 VAC, or 200 to 240 VAC
	Rated Line Frequency	50-60 Hz
	Operating Line Frequency Range	47-63 Hz
	Rated Input Current	6A @ 100VAC/3A @ 200VAC
	Maximum Rated Power	240 watt
	Heat Dissipation	Max (369W input): 1260 BTU/hr Typical (75W input): 256 BTU/hr Max (369W input): 317 kg-cal/hr Typical (75W input): 65 kg-cal/hr
	PS Fan	92mm fan integrated in power supply - variable speed for optimum acoustics
	Processor Fan	Variable speed fan

Environmental and Mechanical Engineering Support Center <http://env-webserver.ccm.cpqcorp.net/EMESC/default.htm>

Power Conservation 'Energy Saver'	Energy Star Compliant	Yes
	APM 1.2 Support	No
	Screen Blanking	Yes
	Hard Disk 'Idle' Mode	Yes
	System Idle Mode	Yes
	Cache Memory Power-Down	No
	Blue Angel Compliant (<5w in S5-Power Off)	Yes
	Power Consumption in ES Mode – Suspend to RAM (S3) (Instantly Available PC)	~2W
	Processor/Cache Memory Power-Down (S3)	Yes
	CD-Rom Spins Down when not in use	Yes

Boot Support	Local Diskette Boot	Yes
	Network Boot	Yes (with PXE supported NICs)

ROM Features

Description

Supported



Standard Features - Base Unit Details

Instantly Available PC (Suspend to RAM - S3)	Allows for very low power consumption with quick resume time	Yes
ROM Based F10 Setup	Allows for reviewing and customizing BIOS settings	Yes
Replicated Setup	Saves BIOS settings to diskette or USB disk-on-key in human-readable file. Repset.exe utility can then replicate these settings on machines being deployed without entering ROM based F10 Setup	Yes
Remote System Installation via F12 (PXE)	Allows a new or existing system to boot over the network and download software, including the operating system, that is stored on a management server	Yes
Failsafe Boot Block ROM	—	Yes
Emergency ROM Flash Recovery (BootBlock)	User is alerted with audible tones and keyboard LEDs only	Yes
CMOS Archive and CMOS Restore	By holding the power button down, allows the last known good BIOS settings (from previous restart) to be restored if the system gets into a locked up state after configuration changes are made	Yes
Save and Restore CMOS Setup via Diskette	—	Yes
Auto Setup when New Hardware Installed	System automatically detects addition of new hardware (e.g. memory, floppy, etc.)	Yes
Serial, Parallel, USB Enable/Disable Port Control	Allows the user to enable or disable serial, parallel or USB ports	Yes
Removable Media Write / Boot Control	Prevents the computer from being booted from removable media on supported devices (and can disable writes to media)	Yes
Remote Boot from Server	Allows a new or existing system to boot over the network and download software, including the operating system, that is stored on a management server	Yes
Network Server Mode	Allows for secured keyboard-less operation on PS/2 devices	Yes
Power-On Password	Prevents an unauthorized person from booting up the computer	Yes
Setup Password	Prevents an unauthorized person from changing the system configuration	Yes
Memory Change Alert (Requires Insight Management Agent)	Alerts management console if memory is removed or changed	Yes

Standard Features - Base Unit Details

Thermal Alert (Requires Insight Management Agent)	- Monitors the temperature within the chassis. - There are three operational states that a computer can experience: - NORMAL – operating under normal temperature ranges - ALERTED – operation when excessive temperatures are detected. Will raise a flag so that appropriate action can be taken to avoid shutdown or provide for a smoother system shutdown - SHUTDOWN – when excessive temperatures are encountered. Will automatically shutdown the computer without warning before hardware component damage occurs	Yes
Cover Removal Alert (Requires Insight Management Agent for network alerts)	- Assists with asset security and control by notifying the Network Administrator and end user when the cover has been removed without authorization. - Is an electronic switch residing inside the computer which can be set to any one-of-three modes depending on the amount of control desired: - DISABLED – the user/network administrator does not want to be made aware of the computer hood removal - NOTIFY USER – notifies user/network administrator that the hood has been removed, but no action required before re-booting the computer - SETUP PASSWORD – notifies user/network administrator that the hood has been removed and administrator password is required before the computer will continue to boot	Yes
Master Boot Record Security	Allows for detection of changes to MBR and optional restoration, useful in protecting from viruses	Yes
Remote ROM Flash	Provides secure, fail-safe ROM image management from a central network console	Yes
Power Management	—	Yes
ACPI Ready	—	Yes
SMBIOS (previously known as DMI)	System Management BIOS, previously known as DMI BIOS, for system management information	Yes
Keyboard-less Operation	The system can be operated without a keyboard	Yes
Remote ROM Flash	Provides secure, fail-safe ROM image management from a central network console	Yes
Remote Wakeup / Remote Shutdown	- Allow a system administrator to power on, restart, and power off a client computer from a remote location. - This enables cost-effective power consumption when the administrator needs to distribute software, perform security management, or update the ROM.	Yes

Standard Features - Base Unit Details

ROM Based Setup (F10) and Start-up Diagnostics	—	Yes
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System Environmental Specs

Acoustics: Advanced Power Management - On	Seated operator position	Idle (Hard drive spinning but not seeking) = 28 dBA
Shock		
Operating (*Using 11-ms half-sine shock pulse)	-----	5 G's* (with no damage being incurred)
Non-Operating (*Using 11-ms half-sine shock pulse)	-----	10 G's*, positive and negative directions front to back axis: 20 G's* in all other axes
Vibration		
Operating	-----	Random vibration at 0.000215 G ² /Hz, 10Hz to 300Hz, (0.25G's nominal)
Non-Operating	-----	Random vibration at 0.0005 G ² /Hz, 10Hz to 500Hz, (0.5G's nominal)
Relative Humidity		
Operating (maximum wet bulb temp., non-condensing)	-----	10% to 90% relative humidity (Rh), 28°C
Non-operating (maximum wet bulb temp., non-condensing)	-----	5% to 95% relative humidity (Rh), 38.7°C
Altitude Max (un-pressurized)		
Operating (Maximum allowable altitude change rate is 1500 ft/min.)	-----	0 to 10,000 feet (3,048 meters) - This value may be limited by the type and number of options installed.
Non-operating (Maximum allowable altitude change rate is 1500 ft/min)	-----	0 to 30,000 ft (9,144 m)

Standard Features - Base Unit Details

Initial Configuration and Deployment

Replicated Setup	Saves BIOS settings to diskette or USB disk-on-key in human-readable file. Repset.exe utility can then replicate these settings on machines being deployed without entering ROM based F10 Setup	Yes
Support Software CD	-----	Yes
HP Software Restore CD	Allows the computer to be restored to its original factory shipping image	Yes
Altiris eXpress Solutions (30-day trial version)	A suite of solutions that focus on business needs in four areas, saving time and freeing resources to address other crucial issues: • Deployment & Migration • Software & Operations Management • Inventory & Asset Management • Help Desk & Problem Resolution	
PC Transplant Pro (30-day trial version)	Makes transferring the files and settings that make your PC unique - its personality - a quick and intuitive process	
System Software Manager (free)	A utility that automatically detects and updates BIOS, device drivers, and management agent versions on your networked PCs	http://h18000.www1.hp.com/im/
Novel ZenWorks 2.0	-----	
Insight Manager	-----	
Insight Management Agent	Provides fault monitoring, alerting, SNMP, DMI, and web agent	
Altiris agent	-----	
HP Management Solutions Partners Program	-----	

Asset Tracking

Asset Tracking and Security Home Page	-----	http://h18000.www1.hp.com/im/swdeploy/dt_nb.html
Asset Tag	• Intended to be used as a repository for storing company-specific property asset numbers for easy tracking • Initially set equal to the system serial number • Stored in a protected section of non-volatile memory which can be accessed and modified with the F10 Setup program	Yes
DIMM Serial Presence Detect	Detects whether or not memory DIMMs are present and their type	Yes
Hard drive serial number, model, and manufacturer	Hard drive manufacturer, model, and serial number is stored in the hard drive firmware and reported in ROM based F10 setup	Yes
Monitor serial number, model & manufacturer		Yes
System serial number, model, & manufacturer	System serial number, model, & manufacturer stored in a non-volatile memory and can be retrieved with management software or viewed in ROM based F10 setup	Yes

Standard Features - Base Unit Details

ROM revision levels	- System ROM revision levels are identified by a version number (xx.yy) and reported in ROM based F10 Setup - Version is stored in an industry standard memory location (SMBIOS) so that management SW applications can use and report this information	Yes
System board revision level	- Allows management SW to read the revision level of the system board - Revision level is digitally encoded into the hardware and cannot be modified	Yes
Memory Change Alert (Intelligent Manageability needed to work)	Alerts management console if memory is removed or changed	Yes
Ownership Tag	A user defined string stored in a non-volatile memory that is displayed on the BIOS splash screen	Yes

Security Features of Chassis

Solenoid Hood Lock	-----	Yes
Hood Sensor	-----	Yes
Kensington Lock Support	-----	Yes
Cable Lock Provision	Allows the user to physically secure computer hardware from theft via a loop on the chassis. With lock installed, this loop also prevents the hood from being removed.	Yes
Serial, Parallel, USB Enable/Disable	Allows the user to enable or disable serial, parallel or USB ports and hide them from the operating system	Yes
Port Control	Device which attaches to back of chassis covering external ports and thereby preventing unauthorized access; also aids in cable management	Yes
Removable Media Write / Boot Control	Prevents the computer from being booted from removable media on supported devices (and can disable writes to media)	Yes
Power-On Password	Prevents an unauthorized person from booting up the computer	Yes
Setup Password	Prevents an unauthorized person from changing the system configuration	Yes
SmartCard Reader	Security device that prevents system access into the operating system unless the user has the appropriate Smartcard	Optional

Standard Features - Base Unit Details

Fault Notification and Recovery

Fault Management Home Page	-----	http://h18000.www1.hp.com/im/
SMART Hard Drives, Fault Notification, & Prefailure Warranty	- Allows hard drives to monitor their own health and to raise flags if imminent failures were predicted - Predicts failures before they occur. Tracks fault prediction and failure indication parameters such as re-allocated sector count, spin retry count, calibration retry count - By helping users avoid actual hard drive failures, SMART hard drives act as "insurance" against unplanned user downtime and potential data loss from hard drive failure	Yes
Surge Tolerant Full Ranging Power Supply	Withstands power surges up to 2000V	Yes
Ultra ATA Integrity Monitoring (CRC Checking)	- Provides data transfer verification. - Provides proactive notification of hard drive data transmission problems and recommendations for enhancing system performance - Detects all the following errors types: - single bit errors - double bit errors - an odd number of errors - error bursts up to 32-bits long	Yes
ATA RAID Controller Option	-----	No

System Software Updating

Support Software CD & website	-----	Yes
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Serviceability Features - System

Dual Color Power LED on Front of Computer	Indicates normal operations and fault conditions	Yes
Blinking Power LED Codes	Allows for easy problem resolution	Yes
Diagnostic LED Explanation Table	Number of 1-second blinks (red LED) Diagnosis - followed by a 2 second pause/ repeat: 2 = Processor Thermal Protection Activated 3 = Processor not installed 4 = Power Supply Failure 5 = Memory Error 6 = Video Error 7 = PCA failure (ROM detected failure prior to video) 8 = Invalid ROM, bootblock recover mode	Yes (Available at http://www.compaq.com/support/techpubs/illustrated_parts_map)
Emergency ROM Flash Recovery	-----	Yes
Compaq Diagnostic for Windows Software	-----	Yes
Over-Temp Warning on Screen (Requires IM Agents)	-----	Yes

Standard Features - Base Unit Details

HP OS CD (Restore OS CD)	Allows the computer to be restored to its original factory shipping image	Yes
HP Restore CD (Restores Drivers CD)	Allows the computer to be restored to its original factory shipping image	Yes
Flash ROM	-----	Yes
3.3V Aux Power LED on System PCA	-----	Yes
Dual Function 5V Aux Power LED (ON) / PS_ON LED (OFF) on System PCA	-----	Yes
Diagnostic Power Switch LED on board	-----	Yes (On when power switch pushed)
Clear Password Jumper	-----	Yes
Clear CMOS Button	-----	Yes
CMOS Battery Holder for easy Replacement	-----	Yes
Processor ZIP Socket for easy Upgrade	-----	Yes
DIMM Connectors for easy Upgrade	-----	Yes
NIC LEDs (integrated) (Green & Amber)	Used to determine NIC status	Yes (Green On = Network Activity; Amber On = 100Base-TX; Amber Off = 10Base-TX)

Serviceability Features

Tool-less PCI Card Removal	-----	Yes
Tool-less AGP Card Removal	-----	Yes
Dual Color Power and Hard Drive LED	Indicates Normal Operations and Fault Conditions	Yes
Diagnostic LED Explanation Table	-----	Yes (Available at http://www.compaq.com/support/techpubs/illustrated_parts_map)
Emergency ROM Flash Recovery	-----	Yes

Standard Features - Base Unit Details

Smart Cover Sensor (Requires Insight Management Agent for network alerts)	- Assists with asset security and control by notifying the Network Administrator and end user when the cover has been removed without authorization. - Is an electronic switch residing inside the computer which can be set to any one-of-three modes depending on the amount of control desired: - DISABLED – the network administrator does not want to be made aware of the computer hood removal - NOTIFY USER – notifies network administrator that the hood has been removed, but no administrator action required before re-booting the computer - SETUP PASSWORD – notifies network administrator that the hood has been removed and administrator password is required before re-booting the computer	Yes
Solenoid Hood Lock	Remote operated system lock	Yes
Green Pull Tabs, and Quick Release Latches for easy Identification	-----	Yes
System memory can be upgraded without removing the system board or any internal components	Eases memory upgrading	Yes
Tool-less Hood Removal	Eases entry to the chassis without use of special tools	Yes (with captive thumbscrews)
Tool-less Hard Drive, CD & Diskette Removal	-----	Yes
Tool-less System Board Removal	No special tools required for system board removal or maintenance	Yes
Industry-standard CD Bay	-----	Yes

Serviceability Features - Hard Drives

Drive Self Tests (DPS)	- Drive Protection System - A diagnostic hard drive self test. It scans critical physical components and every sector of the hard drive for physical faults and then reports any faults to the user.	Yes
DPS Access through F10 Setup during Boot	Running independently of the operating system, it can be accessed through a Windows-based diagnostics utility or through the computer's setup procedure. It produces an evaluation on whether the hard disk drive is the source of the problem and needs to be replaced.	Yes
DPS Access through Diagnostics for Windows	The system expands on the Self-Monitoring, Analysis, and Reporting Technology (SMART), a continuously running systems diagnostic that alerts the user to certain types of failures	Yes

Standard Features - Base Unit Details

SMART Technology (Self-Monitoring, Analysis and Reporting Technology)	• Allows hard drives to monitor their own health and to raise flags if imminent failures were predicted • Predicts failures before they occur. Tracks fault prediction and failure indication parameters such as re-allocated sector count, spin retry count, calibration retry count	Yes
SMART I - Drive Failure Prediction		Yes
SMART II - Off-Line Data Collection	• By helping users avoid actual hard drive failures, SMART hard drives act as "insurance" against unplanned user downtime and potential data loss from hard drive failure	Yes
SMART III - Off-Line Read Scanning with Defect Reallocation		Yes

Service and Support

On-site Warranty and Service [Note 1](#): This three-year, limited warranty and service offering delivers three years of on-site, next business-day [Note 2](#) service for parts and labor and includes free telephone support [Note 3](#) 24 x 7. Global coverage [Note 2](#) ensures that any product purchased in one country and transferred to another, non-restricted country will remain fully covered under the original warranty and service offering.

[NOTE 1](#): Terms and conditions may vary by country. Certain restrictions and exclusions apply.

[NOTE 2](#): On-site service may be provided pursuant to a service contract between HP and an authorized HP third-party provider, and is not available in certain countries. Global service response times are based on commercially reasonable best effort and may vary by country.

[NOTE 3](#): Technical telephone support applies only to HP-configured, HP and HP-qualified, third-party hardware and software. Toll-free calling and 24 x 7 support may not be available in some countries.

After-Market Options

		Part Number
Communications	Wireless	
	HP WL215 USB (802.11b)	191810-B22, AE1, 292 DC758A
	HP WL215 USB (802.11b)	DC758B
	HP WL210 PCI (802.11b)	191809-001, 021, 292 DC756A
	802.11 PCI adapter (802.11b) - (full-height and low profile)	DC756B
	Networking	
	Compaq NetExtreme™ 10/100/1000 Management Gb Adapter	266997-B21
	Intel Pro 1000 MT NIC	DC193A
	HP Gigabit by Broadcom Full Height PCI management adapter	DC195A
	Intel 10/100 S Management Adapter	212953-B21 DC133A
	Intel 10/100 S Management Adapter (20-pack)	212954-B21 DC134A
	Modems	
	56K PCI Win Modem	239137-xxx DC131A
	USB 56K Fax Modem	228141-xxx DC585A
Graphics	2D Single Head Graphics	
	NVIDIA GeForce4 MX-440-8 64-MB DDR LP 8X AGP VGA w/TV-out	DC663A
	2D Multi-Display Graphics	
Hard Drives and Controllers	NVIDIA Quadro4 100NVS 32-MB AGP dualhead with VGA cables	DC665A
	SMART III Ultra ATA/100 Hard Drives with Drive Protection System (DPS)	
	40-GB 7200 rpm Ultra ATA/100 Hard Drive	201066-B21 DC180A
	80-GB 7200 rpm Ultra ATA/100 Hard Drive	250020-B21 DC181A
	160-GB 7200 rpm Ultra ATA/100 Hard Drive	DC189A
	250-GB 7200 rpm Ultra ATA/100 Hard Drive	DC516A
	Cables	
	2 Device IDE Cable	260626-B21 DC183A

After-Market Options

Input/Output Devices

Keyboards

PS/2 Easy Access Keyboard (carbonite/silver)	DC167B#xxx
USB Easy Access Keyboard	DC168B#xxx
Wireless Easy Access Keyboard with Wireless/Optical Mouse	DC170B#xxx
USB Easy Access SmartCard Keyboard	DC169B#xxx

Mice

PS/2 2-Button Scroll Mouse (carbonite)	DD440B
USB 2-Button Scroll Mouse (carbonite)	DD441B
Wireless Optical Mouse (carbonite)	DC210B
USB 2-Button Optical Scroll Mouse (carbonite)	DC172B

Memory (DIMMs)

333-MHz (PC2700) DDR DIMMs Non-ECC

1-GB DDR Synch DRAM PC2700 (333-MHz) Non-ECC	313886-292 DC341A
512-MB DDR Synch DRAM PC2700 (333-MHz) Non-ECC	313885-292 DC340A
256-MB DDR Synch DRAM PC2700 (333-MHz) Non-ECC	313884-292 DC339A
128-MB DDR Synch DRAM PC2700 (333-MHz) Non-ECC	313883-292 DC338A

266-MHz (PC2100) DDR DIMMs Non-ECC

1-GB DDR Synch DRAM PC2100 (266-MHz) Non-ECC	313883-292 DC166A
512-MB DDR Synch DRAM PC2100 (266-MHz) Non-ECC	282435-B21 DC165A
256-MB DDR Synch DRAM PC2100 (266-MHz) Non-ECC	282434-B21 DC164A
128-MB DDR Synch DRAM PC2100 (266-MHz) Non-ECC	282433-B21 DC163A

Monitors

Essential Series

Compaq S9500 CRT Monitor (19-inch, Carbon/Silver)	261615-xxx
Compaq S7500 CRT Monitor (17-inch, Carbon/Silver)	261606-xxx
Compaq S5500 CRT Monitor (15-inch Carbon/Silver)	261602-xxx
Compaq TFT1501 Flat Panel Monitor (15-inch, Carbon/Silver, North America)	301042-003
Compaq TFT1501 Flat Panel Monitor (15-inch, Carbon/Silver, Outside North America)	P4825D-xxx
Compaq TFT1701 Flat Panel Monitor (17-inch, Carbon/Silver, North America)	292847-003
Compaq TFT1701 Flat Panel Monitor (17-inch, Carbon/Silver, Outside North America)	P9019A-xxx

After-Market Options

Advantage Series

Compaq V7550 CRT Color Monitor (17-inch, Carbon/Silver)	261611-xxx
Compaq TFT1720 Flat Panel Monitor (17-inch, Carbon/Silver, North America)	295926-003
Compaq TFT1720 Flat Panel Monitor (17-inch, Carbon/Silver, outside North America)	D5064D-xxx
Compaq FT1720M Flat Panel Monitor (17-inch, (Carbon/Silver, includes speaker, USB port, headphone, North America)	301958-003
Compaq TFT1720M Flat Panel Monitor (17-inch, (Carbon/Silver, includes speaker, USB port, headphone, outside North America)	D5064P-xxx
Compaq TFT1520 Flat Panel Monitor (17-inch, Carbon/Silver, North America)	295925-003
Compaq TFT1520 Flat Panel Monitor (17-inch, Carbon/Silver, outside North America)	D5063D-xxx
Compaq TFT1520M Flat Panel Monitor (17-inch, (Carbon/Silver includes speaker, USB port, headphone, North America)	301957-003
Compaq TFT1520M Flat Panel Monitor (17-inch, (Carbon/Silver includes speaker, USB port, headphone, outside North America)	D5063P-xxx

Performance Series

HP P930 CRT Monitor (19-inch, Flat-screen, Carbon/Silver, North America)	302268-003
HP P930 CRT Monitor (19-inch, Flat-screen, Carbon/Silver, Outside North America)	P909W-xxx
HP P1130 CRT Monitor (21-inch, Flat-screen, Carbon/Silver, North America)	30227-003
HP P1130 CRT Monitor (21-inch, Flat-screen, Carbon/Silver, Outside North America)	P4819-xxx
HP L1825 Flat Panel Monitor (18-inch, Carbon/Silver, North America)	303486-003
HP L1825 Flat Panel Monitor (18-inch, Carbon/Silver, Outside North America)	P9021W-xxx
HP L2025 Flat Panel Monitor (20-inch, Carbon/Silver, North America)	303102-003
HP L2025 Flat Panel Monitor (20-inch, Carbon/Silver, Outside North America)	P4831W-xxx

Multimedia

Labtec Spin-22 Speakers (carbon)	246637-001 DC186A
PC Comm Station Pro (speaker, headphone, wireless keyboard and mouse)	302002-XXX P8815A or P8815B
PC Comm Station (speaker and headphone)	304251-XXX P8814A or P8814B

After-Market Options

Optical Drives	DVD-ROM Drives	
	16X/40X DVD-ROM with +R Read Drive (carbonite)	DC151B
	CD-ROM Drives	
	48X Max CD-ROM Drive (carbonite)	DC143B
	CD-RW Drives	
	48X/24X/48X CD-RW Drive (carbonite)	DC196B
	DVD+RW Drives	
	4X DVD+R/+RW Drive	DC517B
	Combo Drives	
	48X Combo Drive CD-RW & DVD-ROM (carbonite)	DC197B
Removable Storage	ZIP 250 Drive (carbonite)	DC140B
	ZIP 250 Media 3-Pack	217896-B21 DC138A
	ZIP 750 Drive (carbonite)	DC518B
	ZIP 750 Media 3-Pack	DC519A
	TR5 10/20 GB IDE Tape Drive (carbonite)	DC139B
Security	Identix BioTouch USB Fingerprint ID Device	240238-B21
	HP Business PC Security Lock Kit	PV606AA
	Chassis clamp lock, universal, no cable	DE817A
	Kensington Lock	294316-B21 DC368A
	Solenoid Lock	252076-B21 DE618A
PCI Card	Hi Speed USB 2.0 PCI Card (Qualified on the d325 for use in North America only)	287636-B21 287636-B21
	1394 Firewire PCI Card	DE471A
USB Storage Options	16-MB USB Drive Key (Carbonite) "New Disk-On-Key ID"	DC192B
	32-MB USB Disk-On-Key (Carbon)	301993-B21 DC142A
	64-MB USB Disk-On-Key (Carbon)	DC191A
	64-MB USB Drive Key (Carbonite) "New Disk-On-Key ID"	DC191B
	128-MB USB Disk-On-Key (Carbon)	DC190A
	128-MB USB Drive Key (Carbonite) "New Disk-On-Key ID"	DC190B
	1.44-MB USB Floppy Drive - External (Carbon)	304707-B21 DC141A

Memory

NVIDIA nForce2 GT chipset

DDR SYNCH DRAM DIMM Non-ECC Memory

The HP Business Desktop d325 PC has two memory DIMM slots and supports dual channel memory configurations. It is not necessary to add memory in pairs or kits, but for best performance, memory should be added in pairs and should be the same type. For example, 2x128-MB memory modules will perform better on some applications than 1x256-MB memory module because of the dual channel memory support on the d325.

Standard Memory

Configurations can be selected with a 128-MB, 256-MB, 512-MB, 1024-MB, or 2048-MB memory. Memory types supported include PC2100 (DDR266) and PC2700 (DDR333).

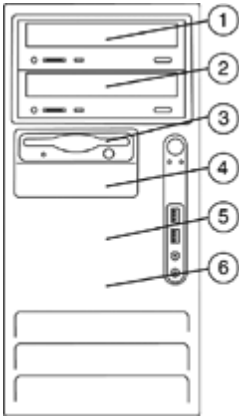
Various combinations of single-DIMM (for future upgradeability) and double-DIMM (for enhanced dual-channel memory performance) will be offered.

Other "mis-matched" memory combinations, such as 384MB (using 1x128-MB and 1x256-MB) will not be offered due to performance limitations of the d325. In these mis-matched configurations, the maximum operation speed is determined by slowest DIMM. After installing a mis-matched configuration, the following message will appear on the screen: "217 Memory DIMM Configuration Warning: Installed memory DIMM configuration is unbalanced. Multiple DIMMs installed of unequal size. For best performance, use a balanced DIMM configuration."

Memory Configuration	Slot 1	Slot 2
128-MB DDR266	128-MB	Empty
256-MB DDR266	128-MB	128-MB
256-MB DDR266	256-MB	Empty
128-MB DDR333	128-MB	Empty
256-MB DDR333	128-MB	128-MB
256-MB DDR333	256-MB	Empty
512-MB DDR333	256-MB	256-MB
512-MB DDR333	512-MB	Empty

NOTE: It is not necessary to add memory in pairs or kits. Memory upgrades are accomplished by adding single or multiple DIMMs of the same or varied sizes. This chart does not represent all possible memory configurations.

Storage



	Quantity Supported	Position Supported	Controller
Microtower			
Diskette Drives	2	3, 4	Diskette
Tape Drive	2	1, 2	IDE
CD-ROM Drives	2	1, 2	IDE
DVD-ROM Drives	2	1, 2	IDE
CD-RW Drives	2	1, 2	IDE
Combo Drives	2	1, 2	IDE
SMART III Ultra ATA Hard Drives	2	5, 6	Ultra ATA

Technical Specifications - Audio

Integrated ADI 1981A Audio	Type	Integrated
	AC '97 Stereo Codec	Yes
	OPL3 FM Synthesis Support	Yes
	Sound Blaster Compatibility	Yes
	Audio Jacks	Mic-In (20-K ohm Input Impedance)
		Line-In (12-K ohm Input Impedance)
		Line-Out * (less than 800 ohms Output Impedance, expects at least a 10-K ohm load)
		Headphone-Out (2.5 Ohms Output Impedance, expects at least a 32 ohm load)
	NOTE: *Internal Speaker Amplifier is for Internal Speaker only. External Speakers need to be powered externally.	
	Sampling	7kHz to 48KHz
Compression	ADPCM, ESPCM	
Wavetable Syntheses (software)	Yes	
3D Positional Sound	No	
Analog Audio:	Number of Channels on Line-Out (mono/stereo)	Stereo (Left & Right channels)
	Internal Audio Speaker Power Rating	3W
	Internal Speaker	Yes
	Internal Tuned Port Speaker	Yes
	Hardware Equalizer for Internal Speaker	5 Band EQ
	External Speaker Jack (Line-Out)	Yes

Technical Specifications - Communications

Integrated 3Com 3C920B-EMB Fast Ethernet Controller	Manufacturer	3Com	
	Connector	RJ-45	
	Bus	32-bit PCI	
	Media	10BASE-T/100BASE-TX	
	Management capabilities	ACPI, WOL and DMI 2.0, PXE 2.0, WfM 2.0, SOS alerting	
	Configuration	Network transfer rate	10BaseT (half-duplex) 10 Mbps 10BaseT (full-duplex) 20 Mbps 100BaseTX (half-duplex) 100 Mbps 100BaseTX (full-duplex) 200 Mbps
		Data interface	PCI, 32-bit bus mastering
		I/O address	Automatic I/O address
		Interrupt level	Automatic IRQ setup
		Standards compliance	PCI 2.2, PC'99, RWU
		Drivers	Microsoft Windows Me
			Microsoft Windows 2000
			Microsoft Windows 9x
			Microsoft Windows NT
			Windows XP
		Linux	
		Remote wakeup	Yes, PME
		Operating distance	10BASE-T/100BASE-TX up to 100 meters (328 feet)
		Proactive alert technology	No
	Environmental operating requirements	Temperature	32° to 131° F (0° to 55° C)
Humidity (non-condensing)		10% to 90%	
Power management		ACPI	
Network management		Any SNMP management medium including 3Com DynamicAccess® boot services, and 3Com DynamicAccess Managed PC Boot Agent	
Power		+ 3.3 V, 340 mA	
LED indicators	100-Mbps link, 10-Mbps link, activity		
Dimensions	4.7 x 2.2 in (12.0 x 5.6 cm)		

Technical Specifications - Communications

Intel Pro 1000 MT NIC	Connector	RJ-45
	Controller	Intel 82540EM Gigabit Controller
	Memory	Integrated 96Kb frame buffer memory
	Data rates supported	10/100/1000 Mbps
	Compliance	IEEE 802.1A, 802.1P, 802.1Q, 802.1Q, 802.2, 802.3, 802.3AB and 802.3u compliant, 802.3x flow control
	Bus architecture	PCI 2.2
	Data path width	32-bit, 33/66 MHz bus interface
	Data transfer mode	Bus-master DMA
	Hardware certifications	FCC, B, CE, TUV- cTUVus Mark Canada and United States, TUV- GS Mark for European Union
	Power requirement	5V_PCI with 4.75V to 5.25V operating range
	Boot ROM support	Yes
	Network transfer rate	10BASE-T (half-duplex) 10 Mbps
		10BASE-T (full-duplex) 20 Mbps
		100BASE-TX (half-duplex) 100 Mbps
		100BASE-TX (full-duplex) 200 Mbps
		1000BASE-T, 1000 Mbps
	Environmental	Operating temperature 32° to 131° F (0° to 55° C)
		Operating humidity 85% at 131° F (55° C)
	Dimensions	4.7 x 4.7 x 0.8 in (12.1 x 12.1 x 1.9 cm)
	Operating system driver support	Microsoft Windows NT 4.0, Microsoft Windows 98, Microsoft Windows 2000, Microsoft Windows XP Professional, Linux 2.2, Linux 2.4
	Management capabilities	ACPI, WOL and DMI 2.0, PXE 2.0, WfM 2.0, Intel PROset II utility

Broadcom NetXtreme Gigabit Ethernet	Connector	RJ-45
	Controller	Broadcom 5782 PCI LAN Controller
	Memory	Integrated 96Kb frame buffer memory
	Data rates supported	10/100/1000 Mbps
	Compliance	IEEE 802.1A, 802.1P, 802.1Q, 802.1Q, 802.2, 802.3, 802.3AB and 802.3u compliant, 802.3x flow control
	Bus architecture	PCI 2.2
	Data path width	32-bit, 33/66 MHz bus interface
	Data transfer mode	Bus-master DMA
	Hardware certifications	FCC, B, CE, TUV- cTUVus Mark Canada and United States, TUV- GS Mark for European Union
	Power requirement	1.48 watts @ +3.3V AUX supply with 5V tolerance
	Boot ROM support	Yes
	Network transfer rate	10BASE-T (half-duplex) 10 Mbps
		10BASE-T (full-duplex) 20 Mbps
		100BASE-TX (half-duplex) 100 Mbps
		100BASE-TX (full-duplex) 200 Mbps
		1000BASE-T, 1000 Mbps

Technical Specifications - Communications

Environmental	Operating temperature	32° to 131° F (0° to 55° C)
	Operating humidity	85% at 131° F (55° C)
Dimensions		4.7 x 2.0 x 0.08 in (12 x 5 x 1.9 cm)
Operating system driver support		Microsoft Windows NT 4.0, Microsoft Windows 98, Microsoft Windows 2000, Microsoft Windows XP Professional, Linux 2.2, Linux 2.4
Management capabilities		ACPI, WOL and DMI 2.0, PXE 2.0, WfM 2.0, Broadcom mgmt utility
Alerting		ASF 1.0

Lucent 56K PCI Win Modem

Data Transmission	K56 flex technology speeds: 56,000 Kbps maximum downstream data, controllerless
	NOTE: 56 Kbps technology refers to download speeds only and requires compatible modems at server sites. Other conditions may limit modem speed. FCC limitations allow a maximum of 53 Kbps during download transmissions
Data Speeds	(Upload only) 33,600/31,200/28,800/26,400/21,600/19,200/16,800/14,400/12,000/9,600/7,200/4,800/2,400/1,200/300
Data Standards	ITU high speed 56K modem, ITU-T, V.34bis, V.22bis, V.22bis, V.21, V.23, Bell 212A, and Bell 103
Fax speeds	14,400/12,000/9,600/7,200/4,800/2,400/1,200/300 b/s
Fax mode capabilities	Group3 FAX, V. 17, V.29, V.27ter, and V.21 Channel 2, Class 1
Error Correction and Data Compression	V.44 (software upgradeable), 4.2bis, V.42 and MNP2-5
Power Management	APM and ACPI states D0, D1, D2, and D3; meets PCI 2.2 requirements and PC'99 requirements
Upgradability	Software driver upgradeable for high speed 56K modem and future enhancements
Video	ITU-T V.80 video ready interface
Other	TIA/EIA 602 standard AT command set
	Integrated DTE interface with speeds of up to 115.2 Kbps, parallel 16550a UART-compatible interface
	Optional ring wakeup signal
Operating temperature	32° to 104° F (0° to 40° C)
Operating humidity	20% to 80%, non-condensing
Power	Requires a 3.3-V auxiliary power rail on PCI bus
	Uses only one PCI load (i.e., one grant/request pair), one shared IRQ, one electrical load
Chipset	Agere Systems 1648C (Mars 3.2)—Integrated PCI interface with 5-V tolerant buffers and CardBus support
Dimensions (L X H)	Complies with PCI low profile specifications—6.7 x 2.3 in (17.0 x 5.8 cm) and supports high- and low-profile brackets
Connection	Dual, parallel RJ-11 support with auxiliary Tip/Ring connector
Other features	Digital line protection, call progress monitoring via on-board piezo device, transformer-based DAA design, support for high profile and low profile brackets, PnP ID supports via external EEPROM
Safety	UL recognized to UL 1950, 3rd edition (U.S. and Canada); IEC 950 (TUV, NEMKO, DEMKO, SEMKO); CE Mark, EC 950 (TUV, NEMKO, DEMKO, SEMKO, CE mark)

Technical Specifications - Communications

EMC	FCC Part 15, IC ES003, EN 55022, 3rd edition, EN 55024, annex A, EN 61000-4-6, EN 61000-4-8
Telecom	FCC Part 68, IC-CS-03 (Canada); Worldwide PTT approvals
Health	Bare PCB material compliant to 94V-0 or better (marked as such), Microsoft Windows Me health compliant
Other	PC'99 compliant, PCI version 2.2, WHQL approved; support for ACPI revision 1.1

Technical Specifications - Graphics

Integrated NVIDIA GeForce4 MX 64-MB Graphics	3D/2D Controller	Integrated GeForce4 MX Graphics Processing Unit (GPU)		
	VGA Controller	Integrated		
	Bus Type	AGP8X for external graphics cards (Internal graphics is disabled if external AGP Graphics card is installed)		
	RAMDAC	Integrated 300-MHz DAC		
	Memory	Graphics memory is shared with system memory. Graphics memory usage can vary from 16 – 128MB depending on the amount of system memory installed and system BIOS settings.		
	Memory (Shared)	16-128MB DDR		
	Memory Bandwidth (Max Shared)	5.3 GB/second		
	Triangles/Second (Max)	24 million		
	Fill Rate (Max)	760 Million texels/second		
	Controller Clock Speed	200 MHz		
	Overlay Planes	Support is fully compliant with Microsoft standard API such as Direct Draw and Direct Show.		
	Max Color Depth	32-bits/pixel		
	Maximum Vertical Refresh Rate	85 Hz at 1920x1200, 75 Hz at 1920x1440, 60 Hz at 2048x1536		
	Multi-display Support	Yes. Two VGA ports integrated in system motherboard.		
	Operating Systems	Microsoft Windows XP and Windows 2000		
	Graphics API Support	Complete Microsoft DirectX® support, including DirectX 8.1; complete OpenGL® 1.3 support. Compatible with DirectX 9. NVIDIA Shading Rasterizer with 24 of 26 DX8 pixel shading functions and full set of OpenGL1.3 pixel combiner operations in hardware.		
	Resolutions Supported			
Resolution	Maximum Refresh Rate (Hz)	Resolution	Maximum Refresh Rate (Hz)	
320 x 200	75	1280 x 1024	85	
320 x 240	75	1600 x 900	85	
400 x 300	75	1600 x 1200	85	
480 x 360	75	1920 x 1200	85	
512 x 384	75	1920 x 1440	75	
640 x 400	85	2048 x 1536	60	
640 x 480	85			
800 x 600	85			
1024 x 768	85			

Technical Specifications - Graphics

NVIDIA GeForce4 MX 440 Graphics Controller	3D/2D Controller	NV18 128-bit Graphics Processing Unit (GPU)
	VGA Controller	Integrated
	Bus Type	AGP8X
	RAMDAC	350-MHz DAC
	Memory	64-MB 128-bit DDR frame buffer memory
	Controller Clock Speed	275 MHz
	Overlay Planes	1
	Stencil Planes	8-bit
	Alpha Planes	8-bit
	Z-buffer	32-bit
	Total Bits/Pixel	32-bits/pixel
	Maximum Vertical Refresh Rate	75 Hz at 2048 x 1536
	Maximum Colors	32-bit color
	Multi-display Support	Includes support for one CRT and TV simultaneously (VGA and S-Video connectors)
	Operating Systems	Microsoft Windows XP and Windows 2000
	Graphics API Support	Complete Microsoft DirectX® support, including DirectX 8.1; complete OpenGL® 1.3 support
Resolutions Supported		
	Resolution	Maximum Refresh Rate (Hz)
	640 x 480	150
	800 x 600	150
	1024 x 768	120
	1280 x 1024	100
	1600 x 1200	85
	1920 x 1080	75
	1920 x 1200	75
	1920 x 1440	75

NVIDIA Quadro4 100 NVS Graphics Controller	3D/2D Controller	Integrated Quadro4 2D/3D 128-bit graphics processor unit (GPU)
	VGA Controller	Integrated into the Quadro4 GPU
	Bus Type	AGP 4x or PCI
	RAMDAC	Dual 350 MHz
	Memory Speed and Type	166MHz 8Mx16 DDR
	Memory Amount	64 MB
	Texture Memory	Unified with frame buffer
	Form Factor	ATX and SFF
	Controller Clock Speed	250 MHz
	Color Planes	32-bit color buffer
	Overlay Planes	1 16-bit Video overlay plane, software emulation for OpenGL overlay planes
	Stencil Planes	8-bit stencil buffer
	Alpha Planes	8-bit alpha buffer
	Z-buffer	24-bit
	Total bits/pixel	64

Technical Specifications - Graphics

Maximum Vertical Refresh Rate	120 MHz
Maximum Pixel Clock	350 MHz
Dual Screen Support	Yes, with nView
Single DVI Support	Yes
Dual DVI Support	Yes
Operating Systems	Microsoft Windows XP, Microsoft Windows 2000
nView Hardware Architecture	32-bit color 2048 x 1536 @ 60 Hz maximum resolution 2D rendering engine optimized for 32-, 24-, 16-, 15-, and 8-bpp modes
High-definition Video Processor (HDVP)	Full-screen, full-frame video playback of HDTV and DVD content DVD-ready motion compensation for MPEG-2 Independent hardware color controls for video overlay Hardware color-space conversion (YUV 4:2:2 and 4:2:0) IDCT motion compensation 5-tap horizontal by 3-tap vertical filtering 8:1 up/down scaling

Resolutions Supported		
Resolution	Maximum Colors Supported	Maximum Refresh Rate (Hz)
640 x 480	16.7 M	120 Hz
800 x 600	16.7 M	120 Hz
1024 x 768	16.7 M	120 Hz
1152 x 864	16.7 M	120 Hz
1280 x 1024	16.7 M	120 Hz
1600 x 1200	64 K	100 Hz
1600 x 1200	16.7 M	85 Hz
1920 x 1080	64 K	100 Hz
1920 x 1080	16.7 M	75 Hz
1920 x 1200	64 K	85 Hz
1920 x 1200	16.7 M	70 Hz
1920 x 1440	64 K	75 Hz
1920 x 1440	16.7M	60 Hz
2048 x 1536	64 K	60 Hz

Technical Specifications - Hard Drives

7200 rpm SMART III Ultra 160-GB ATA/100 Hard Drives	Capacity	160,000 MB
	Rotational Speed	7200 rpm
	Interface	Ultra ATA/100
	Height	1 in (25.4 mm)
	Width	3.5 in (88.9 mm)
	Transfer Rate	100 MB/s
	Synchronous (Maximum)	
	Seek Time (typical reads, including settling)	Single Track1.2 ms
		Average8 ms
		Full-Stroke18 ms
	Physical Configuration	Logical Blocks157,278,240
	Operating Temperature	41° to 131° F (5° to 55° C)
80-GB	Capacity	80,000 MB
	Rotational Speed	7200 rpm
	Interface	Ultra ATA/100
	Height	1 in (25.4 mm)
	Width	3.5 in (88.9 mm)
	Transfer Rate	100 MB/s
	Synchronous (Maximum)	
	Seek Time (typical reads, including settling)	Single Track1.2 ms (2.7 ms quiet seek)
		Average8 ms (10.1 ms quiet seek)
		Full-Stroke18 ms (21.1 ms quiet seek)
	Physical Configuration	Logical Blocks157,278,240
	Operating Temperature	41° to 131° F (5° to 55° C)
40-GB	Capacity	40,000 MB
	Rotational Speed	7200 rpm
	Interface	Ultra ATA/100
	Height	1 in (25.4 mm)
	Width	3.5 in (88.9 mm)
	Transfer Rate	100 MB/s
	Synchronous (Maximum)	
	Seek Time (typical reads, including settling)	Single Track1.2 ms (2.7 ms quiet seek)
		Average8 ms (10.1 ms quiet seek)
		Full-Stroke18 ms (21.1 ms quiet seek)
	Physical Configuration	Logical Blocks78,165,360
	Operating Temperature	41° to 131° F (5° to 55° C)

Technical Specifications - Hard Drives

5400 rpm SMART III Ultra 80-GB
ATA/100 Hard Drives

Capacity	80,000 MB
Rotational Speed	5400 rpm
Interface	Ultra ATA/100
Height	1 in (25.4 mm)
Width	3.5 in (88.9 mm)
Transfer Rate	100 MB/s
Synchronous (Maximum)	
Seek Time (typical reads, including settling)	Single Track1.2 ms
	Average8 ms
	Full-Stroke18 ms
Physical Configuration	Logical Blocks78,165,360
Operating Temperature	41° to 131° F (5° to 55° C)

40-GB

Capacity	40,000 MB
Rotational Speed	5400 rpm
Interface	Ultra ATA/100
Transfer Rate	66 MB/s
Synchronous (Maximum)	
Height	1 in (25.4 mm)
Width	3.5 in (88.9 mm)
Seek Time (typical reads, including settling)	Single Track1.5 ms
	Average10.5 ms
	Full-Stroke23 ms
Physical Configuration	Logical Blocks39,102,336
Operating Temperature	41° to 131° F (5° to 55° C)

Technical Specifications - Input/Output Devices

USB Easy Access Smartcard Keyboard	Physical characteristics	Keys	104, 105, 106, 107, 109 layout (depending upon country) plus eight programmable keys for Internet, shortcuts, or multimedia
		Form factor	USB basic smartcard keyboard
		Colors	Carbon
		Dimensions (H x W x D)	18.2 x 6.3 x 1.3 in (46.3 x 16.1 x 3.3 cm)
		Weight	2 lb (0.9 kg) minimum
Easy Access Keyboard (PS/2 or USB)	Dimensions (HxWxD) Weight Electrical	Dimensions (H x W x D)	1.4 x 18.3 x 6.3 in (36 x 465 x 160 mm)
		Weight	Approximately 2 lb (0.9 kg)
		Operating Voltage	+ 5VDC $\pm$ 5%
	Mechanical	Power Consumption	50 mA maximum (with 3 LEDs on)
		System Interface	PS/2 mini-din connector
		ESD	CE level 4, 15 kV air discharge
		EMI-RFI	Conforms to FCC rules for a Class B computing device
		PC98	Functionally compliant
		Languages	30+ available
		Keycaps	Low-profile design
		Switch Actuation	55 g nominal peak force with tactile feedback
		Switch Life	20 million keystrokes (using Hasco modified tester)
		Switch Type	Contamination resistant membrane
		Key Leveling Mechanism	For all double wide and greater length keys
	Environmental	Cable Length	6 ft (1.8 m)
		PC98-99	Mechanically compliant
		Acoustics	50 dBA maximum sound pressure level
		Operating Temperature	50° to 122° F (10° to 50° C)
		Non-operating Temperature	-22° to 140° F (-30° to 60° C)
		Operating Humidity	10% to 90% (non condensing at ambient)
		Non-operating Humidity	20% to 80% (non condensing at ambient)
		Operating Shock	40 g, 6 surfaces
		Non-operating Shock	80 g, 6 surfaces
		Operating Vibration	2 g peak acceleration
		Non-operating Vibration	4 g peak acceleration

Technical Specifications - Input/Output Devices

Wireless/Optical Mouse	Dimensions (H x L x W)	1.76 x 5.11 x 2.92 in (44.7 x 130.0 x 74.2 mm)
	Weight – Without Two AA Alkaline Batteries	0.24 lb (110 g)
	System requirements	Microsoft Windows 2000 or XP Available USB port for the receiver
	Approvals	Product Safety Ergonomics EMC CE Mark Design Guidelines for PCs Telecom USA
		UL, CSA, TUV (Europe only), CE Mark ANSI; ISO (Europe only); GS Mark (Germany only) FCC; CISPR; ACA, BSMI, MIC, VCCI EN 55022:1998; EN 55024 PC 99 - connector overmold colors; PC 2001 - full functionality All local telecom requirements and approvals for intended markets FCC Part 15 Equipment Certificate; CFR 47, Part 15; other local requirements
2-Button Scroll Mouse (PS/2 or USB)	Scroll Wheel	8 mm
	Maximum Rotation Speed	30 mm/s
	Switch Type	Light force micro-switch
	Switch Life	1 million operations
	Mechanical Life	Minimum 200,000 revolutions
	Environmental	Operating Temperature
		Non-operating Temperature
		Operating Humidity
		Non-operating Humidity
		Operating Shock
		Non-operating Shock
		Operating Vibration
		Non-operating Vibration
		Operating Voltage
		Power Consumption
		System Consumption
		ESD
		EMI-RFI
	Electrical	PC98
		50° to 122° F (10° to 50° C) -22° to 140° F (-30° to 60° C) 10% to 90% (non condensing at ambient) 20% to 80% (non condensing at ambient) 40 g, 6 surfaces 80 g, 6 surfaces 2 g peak acceleration 4 g peak acceleration + 5VDC ± 10% 15mA PS/2 mini-din connector CE level 4, 15 kV air discharge Conforms to FCC rules for a Class B computing device Functionally compliant

Technical Specifications - Input/Output Devices

Mechanical	Resolution	400 ± 20% DPI
	Tracking Speed	10 in/s maximum
	Acceleration	100 in/s
	Switch Actuation	85 g nominal peak force
	Switch Life	1,000,000 operations (using Hasco modified tester)
	Cable Length	2 m
	PC98-99	Mechanically compliant
Regulatory Approvals	UL, CSA, FCC, CE Mark, TUV, TUV GS, VCCI, BCIQ, C-Tick	

USB Optical Scroll Mouse	Dimensions (H x L x W)	1.5 x 4.5 x 2.5 in (3.8 x 11.6 x 6.3 cm)
	Weight	0.27 lb (0.12 kg)
	Cable length	72.8 in (185 cm)
	System requirements	IBM-compatible PC
		Microsoft Windows 95, 98, 2000, Me, and XP
	Available USB port	

Technical Specifications - Optical Storage

48X Max CD-ROM Drive	Interface	ATAPI IDE
	Data Buffer	16.6 Mbps
	Data Transfer Rate	Sustained—150 Kbps minimum (audio)
		Variable (CD)—3,000 to 7,200 Kbps
	Disk Rotation Technology	CAV (Constant Angular Velocity)
	Access Time (ms)	Random: <100 ms
		Full-stroke seek: <150 ms
	Average Access Time	< 80 ms
	Cache Buffer	128 KB
	(standard/maximum)	
	Disk Formats Read	Multi-session Photo CD, multi-read CD-ROM, CD text, audio CD, CD-I, CD-RW, CD-R, CD-Extra, CD-ROM XA
	Disk Formats Written	None
	Disk Capacity (CD)	650 MB
	Block Size	Mode 1—2,048 bytes; Mode 2—2,340/2,336 bytes; CD-DA—2,352 bytes;
		CD-XA—2,328 bytes
	Diameter	12 cm; 8 cm
	Thickness	1.2 mm
	Track Pitch	1.6 μ m
	Audio Output Level	Line-out—0.7 V @ 47 Kohm
		Headphone—0.6 V @ 32 ohm
	Startup Time	<7 seconds (typical); < 30 seconds with multi-session
	Operating Conditions	Temperature 41° to 113° F (5° to 45° C)
		Relative Humidity 10% to 80%
	Dimensions (H x W x D, maximum)	1.7 x 5.9 x 8.2 in (4.3 x 15.0 x 20.8 cm)
	Weight	2.6 lb (1200 g)
	Operating Systems Supported	Microsoft Windows NT 4.0, Microsoft Windows 2000, and Microsoft Windows XP.
	MPEG Playback Graphics Solution Support	None

48X/24X/48X CD-RW Drive	Orientation	Either horizontal or vertical
	Disc Loading Mechanism	Half-height, tray load
	Interface Type	ATAPI IDE
	Dimensions—external (W x H x D)	7.99 x 5.88 x 1.71 in (203 x 149.5 x 43.5 mm)
	Weight	2.6 lb (1.2 kg)
	Disc Diameter	12 cm, 8 cm
	Disc Thickness	1.2 mm
	Track Pitch	1.6 μ m
	Disc Center Hole Diameter	15 mm

Technical Specifications - Optical Storage

Read Only Disc Parameters	Reference Scanning Velocity	1.2 m/s
	Recording/Playing Time	80 minutes with CD-R media
	Formats and Modes Supported	CD-ROM—Mode 1; CD-ROM XA—Mode 2 (forms 1 and 2); CD digital audio; CD Extra; CD-I—Mode 2 (forms 1 and 2) and CD-I-Ready; Photo CD (single and multi-session); video CD
	Capacity	185 MB (Mode 2, 8cm); 540 MB (Mode 1, 12 cm); 650 MB (Mode 2, 12 cm); 700 MB (Mode 2, 12 cm)
	Block Size	Mode 1—2,048 and 2,352 bytes; mode 2, form 1—2,048; 2,328; 2,336; 2,340 and 2,352 bytes; mode 2, form 2—2,328; 2,336; 2,340 and 2,352 bytes; CD-DA—2,352 and 2,368 bytes
Writeable Disc Parameters	Disc Type	CD-R and CD-RW
	Write Methods	Disc at Once, Track at Once, Session at Once, Variable Packet, Fixed Packet
	Format and Modes Supported	CD-ROM (mode 1); CD-ROM XA (mode 2, forms 1 and 2); CD digital audio, CD-I (mode 2, forms 1 and 2); video CD
	Capacity	185 MB (Mode 2, 8cm); 540 MB (Mode 1, 12 cm); 650 MB (Mode 2, 12 cm); 700 MB (Mode 2, 12 cm)
	Block Size	Mode 1—2,048 bytes; mode 2, form 1—2,048 and 2,352 bytes; mode 2, form 2—2,352 bytes; CD-DA—2,352 bytes
Access Times (typical)	Random	< 120 ms
	Full Stroke	< 200 ms
Data Transfer Rates	Sustained	CD-R write—1,800 KB/s (12X) CD-R write—2400 KB/s (16X) CD-RW write (1-4X media) —600 KB/s (4X) CD-RW write (4-10X media) —1,500 KB/s (10X) CD-RW write (4-12X media) —1,800 KB/s (12X) CD-RW read—3,600 KB/s (24X) Digital audio extraction (minimum) —7,200 KB/s (48X)
	Variable	CD-RW write—2,400 to 3,600 KB/s (16X to 24X) CD-RW write—2,400 to 4,800 KB/s (16X to 32X) CD-RW write—2,400 to 6,000 KB/s (16X to 40X) CD-RW write—2,400 to 7,200 KB/s (16X to 48X) CD-ROM, CD-R read—1,500 to 7,200 KB/s (10X to 48X)

Technical Specifications - Optical Storage

Data Transfer Modes	ATA PIO mode 4 (16.7MB/s); ATA multi-word DMA mode 2 (16.7 MB/s); ATA UltraDMA mode 0 (16.7 MB/s); ATA UltraDMA mode 1 (24 MB/s); ATA UltraDMA mode 2 (33 MB/s) – default.		
Cache Buffer	2 MB (minimum)		
Start-up Time (single)	< 7 seconds typical		
Start-up Time (multi-session)	< 30 seconds typical		
Stop Time	< 4 seconds		
Power	Source	Four-pin, DC power receptacle	
	DC power requirement	5 VDC $\pm$ 5%—100 mV ripple p-p	
		12 VDC $\pm$ 5%—200 mV ripple p-p	
	DC current	5 VCD	< 1A (typical)
			< 1200 mA (maximum)
		12 VCD	< 600 mA (typical)
			< 1.2A (maximum)
		Total Drive Power (Standby mode)	< 2.5 watt
Audio Output Level	0.7 Vrms		
Configuration Jumper Block	Master, slave and cable select modes		
Data Interface Connector	50-pin IDE interface		
Environmental (all conditions, non-condensing)	Temperature (operating)	41° to 122° F (5° to 50° C)	
	Relative Humidity (operating)	10% to 85%	
	Maximum Wet Bulb Temperature (operating)	84° F (29° C)	

16X/40X DVD-ROM with +R Read Drive	Height	5.25-in, half-height
	Interface Type	ATAPI
	Dimensions– External, Excluding Bezel (W x H)	5.88 x 1.71 in (149.5 x 43.5 mm)
	Disc Diameter	12 cm, 8 cm
	Disc Thickness	1.2 mm
	Track Pitch	1.6 μ m (CD), 0.74 μ m (DVD)
	Disc Center Hole Diameter	15 mm
	Disc Formats	DVD-ROM (single and dual layer); DVD-video; DVD-R version 1.0 and 2.0; DVD-RW version 1.0 and 1.1; DVD-R multi-border; DVD+RW; DVD+R ; CD-ROM Mode 1 and 2; CD-DA; CD-ROM XA Mode 2, Form 1 and 2; CD-extra; CD-text; CD-I Mode 2, Form 1 and 2; CD-I ready; video CD, CD-bridge; PhotoCD (single and multi-session); CD-R; CD-RW

Technical Specifications - Optical Storage

Disc Capacity	DVD-ROM	4.7 GB (DVD-5), 8.54 GB (DVD-9), 9.4 GB (DVD-10), 3.95 GB (DVD-R version 1.0), 4.7 GB (DVD-R version 2.0), 4.7 GB (DVD-RW version 1.0 and 1.1), 4.7 GB (DVD+RW), 4.7 GB (DVD+R)
	CD-ROM	540 MB (Mode 1, 12 cm), 640 MB (Mode 2, 12 cm), 700 MB (80 minimum CD-R and CD-RW), 180 MB (8 cm)
Block Size (bytes)	DVD-ROM – 2048; CD-ROM Mode 0 – 2352; CD-ROM Mode 1 – 2352, 2340, 2336, 2048; CD-ROM Mode 2 – 2352, 2340, 2336, 2048	
Access Times (typical reads, including settling)	DVD-ROM Single Layer	< 120 ms
	CD-ROM Mode 1	< 90 ms
	Full Stroke DVD	< 240 ms (seek)
	Full Stroke CD	< 160 ms (seek)
Data Transfer Rates	2600 – 6000 KB/s (40X CAV CD-ROM mode)	
	8100 – 21,600 KB/s (16X CAV DVD-ROM mode)	
Data Transfer Modes	PIO Mode 4 (16.6 MB/s); Multi-word DMA mode 2 (16.6 MB/s); UltraDMA Mode 3 (44.4 MB/s)	
Power	Source	Four-pin, DC power receptacle
	DC Power Requirement	5 VDC $\pm$ 5% – 100 mV ripple p-p
		12 VDC $\pm$ 5% – 200 mV ripple p-p
	DC Current	5 VDC – <800 mA typical, < 1000 mA maximum 12 VDC – < 870 mA typical
Audio Output Level	0.7 Vrms (typical)	
Configuration Jumper Block	Master, slave, and cable select modes	
Data Interface Connector	40-pin, shrouded and keyed, flat ribbon	
Environmental (all conditions, non-condensing)	Temperature (operating)	41° to 122° F (5° to 50° C)
	Relative Humidity (operating)	10% to 85%
	Maximum Wet Bulb Temperature (operating)	86° F (30° C)
Certifications, Approvals	MMC II support, multi-read certification, Microsoft WHQL certification, ACA AS/NZS 3548 class B, CNS 13438, C.I.S.P.R. Pub 22, TUV or VDE EN60950, EN 55022, EN55024, SEMKO, NEMKO, DEMKO, FIMKO, EN 60825-1, UL 60950, and CSA C22.2 60950-2000.	
Operating Systems Supported	Microsoft Windows NT, Microsoft Windows 2000, and Microsoft Windows XP.	

48X Combo CD-RW/DVD-ROM Drive

Disc Loading Mechanism	5.25-inch, half-height, tray-load
Color	Carbonite
Orientation	Either horizontal or vertical
Interface Type	ATAPI
Dimensions (W x H x D)	5.77 x 1.71 x 7.36 in (146.5 x 43.5 x 187 mm) (external, excluding bezel)
Disc Diameter	12 cm, 8 cm

Technical Specifications - Optical Storage

Disc Thickness	0.05 in (1.2 mm)
Track Pitch	1.6 μ m (CD), 0.74 μ m (DVD)
Disc Center Hole Diameter	0.6 in (15 mm)
Reference Scanning Velocity	1.2 m/s (CD); 3.49 m/s (DVD SL); 3.84 m/s (DVD DL)
Read Only Disc Parameters	Formats and Modes Supported CD-ROM-Mode 1; CD-ROM XA-Mode 2 (forms 1 and 2); CD-Bridge; CD digital audio; CD Extra; CD-I-Mode 2 (forms 1 and 2) and CD-I-Ready; Photo CD (single and multi-session); video CD; DVD (single- and double-layer); DVD-R; DVD-RW; DVD-RW Multi-Border; DVD+R; DVD+R Multi-Session, and DVD+RW Capacity 180 MB (mode 2, 8 cm); 540 MB (mode 1, 12 cm); 650 MB (mode 2, 12 cm); 700 MB (Mode 2, 12 cm); 4.7 GB (DVD-5); 8.54 GB (DVD-9); 9.4 GB (DVD-10) Block Size Mode 1-2,048 and 2,352 bytes; mode 2, form 1-2,048; 2,328; 2,336; 2,340 and 2,352 bytes; mode 2, form 2-2,328; 2,336; 2,340 and 2,352 bytes; CD-DA-2,352 bytes; DVD-2,048 bytes
Writeable Disc Parameters	Disc Type CD-R and CD-RW Write Methods Disc at Once, Track at Once, Session at Once, Variable Packet, Fixed Packet Format and Modes Supported CD-ROM (mode 1); CD-ROM XA (mode 2, forms 1 and 2); CD digital audio, CD-I (mode 2, forms 1 and 2); video CD; CD-Bridge; Video CD Capacity 180 MB (mode 2, 8 cm); 540 MB (mode 1, 12 cm); 650 MB (mode 2, 12 cm); 700 MB (mode 2, 12 cm) Block Size CD-DA-2,352 bytes; mode 0- 2,336 and 2,352 bytes; mode 1-2,048 and 2,352 bytes; mode 2- 2,336 and 2,352; mode 2, form 1-2,048 and 2,352 bytes; mode 2, form 2-2,324 and 2,352 bytes
Access Times (typical reads, including settling)	Random DVD < 140 ms (typical) Random CD < 125 ms, (typical) Full Stroke DVD < 250 ms (seek) Full Stroke CD < 210 ms (seek)
Maximum Data Transfer Rates	CD-R write 7200 KB/s (48X) Max CD-RW write 1500 KB/s (10X) Max CD-ROM, CD-R, CD-RW read 7200 KB/s (48X) Max DVD ROM read 21,632 KB/s (16X) Max
Data Transfer Modes	ATA PIO mode 4 (16.7 MB/s); ATA Multi-word DMA mode 2 (16.7 MB/s); ATA UltraDMA mode 0 (16.7 MB/s); ATA UltraDMA mode 1 (24 MB/s), mode 2 (33 MB/s); ATA UltraDMA Mode 3; 44 Mbytes/s (default)
Cache Buffer	2 MB (minimum)

Technical Specifications - Optical Storage

Start-up Time (single)	< 7 seconds typical	
Start-up Time (multi-session)	< 30 seconds typical	
Stop Time	< 4 seconds	
Power	Source	Four-pin, DC power receptacle
	DC power requirement	5 VDC 5%-100 mV ripple p-p
		12 VDC 5%-200 mV ripple p-p
	DC current	5 VDC (< 1000 mA typical, < 1600 mA maximum)
		12 VDC (< 600 mA typical, < 1400 mA maximum)
	Total Drive Power (Standby mode)	< 2.5 Watt
Audio Output Level	0.7 Vrms	
Configuration Jumper Block	Master, slave, and cable select modes	
Data Interface Connector	40-pin, shrouded and keyed, flat ribbon	
Environmental (all conditions, non-condensing)	Temperature (operating)	41° to 122° F (5° to 50° C)
	Relative Humidity (operating)	10% to 90%
	Maximum Wet Bulb Temperature (operating)	86° F (30° C)
	MPC-3 compliant, multi-read requirements, ACA AS/NZS 3548, ANSI C63.4-1992, ATAPI Spec SFF-8020, ATA Spec X3T9.2, CB Bulletin No. 92A, CSA C22.2 No. 950-1995, C.I.S.P.R. Pub 22, EMKO-TSE 207/94, TUV or VDE EN60 950, EN60825-1, Microsoft PC2001 certification, Microsoft Logo for Windows XP, 2000, and NT4	
Certifications, Requirements		
Operating Systems Supported	Microsoft Windows 2000, Microsoft Windows XP Professional, Microsoft Windows XP Home	

4X DVD+R/+RW Drive	Recording Method	Disc-at-once, Track-at-once, and Session-at-once; Variable Packet and Fixed Packet	
	Interface	ATAPI ATA/ATAPI-5 and SFF-8090 Version 5	
	Disc Recording Capacity	4.7 GB	
	Write Support	DVD+R, DVD+RW, CD-R, CD-RW	
	Read Support	DVD-ROM (single- and dual-layer), DVD+R, DVD+RW, DVD-R, DVD-RW, CD-ROM Mode 1, CD-ROM XA (Mode 2, forms 1 and 2), CD TEXT, Photo CD single- and multi-session), CD-DA (Audio CD), CD-Extra, CD-R, CD-RW (supports AM2)	
	Write Speed	DVD+R	4X CLV (5400 KB/s)
		DVD+RW	2.4X CLV (3250 KB/s)
		CD-R	16X CLV (2400 KB/s)
		CD-RW	10X CLV (1500 KB/s)

Technical Specifications - Optical Storage

Read Speed	DVD-ROM (single)	12X CAV (6750 - 16200 KB/s)
	DVD-ROM (dual)	7X CAV (4050 - 9450 KB/s)
	DVD+R, DVD+RW, DVD-R, DVD-RW	5X CAV (2700 - 6750 KB/s)
	CD-ROM, CD-R	40X CAV (2550 to 6000 KB/s)
	CD-RW	32X CAV (1950 to 4800 KB/s)
	CD-Audio	32X CAV (1950 to 4800 KB/s)
Data Buffer	Read	2 MB
	Write	2 MB
Access Time (random average)	DVD-ROM – 140 ms	
	CD-ROM – 125 ms (CD-ROM Mode 1 disc are used)	
Data Transfer Rates	2400 Kbytes/sec. (maximum) to CD-R media	
	1500 Kbytes/sec. (maximum) to CD-RW media	
System Configuration	Intel Pentium III Processor or later with 128 MB of memory (required); 256 MB recommended 2-D or 3-D graphics cards on primary disk drive for operating system and application software; second disk drive for audio and video data	
Operating Systems Support	Microsoft Windows 2000, Windows XP Professional, Windows XP Home	
Mounting Orientation	Horizontal and vertical	
Power Requirement	5 V, +12 V (1.6A, 1.4A)	
Size	8.0 x 5.9 x 1.7 in (20.3 x 15.0 x 4.4 cm)	
Front Panel Features	Disc loading tray, forced eject hole read/write indicator, eject button	
Rear Panel Features	ATAPI interface, digital audio output 1, analog audio output, device configuration jumper, DC input DC Power Connector, 4 pin; Line Out Connector, 4 pin; IDE Bus Connector, 40 pin; Configuration Jumper Pins; Label to identify each connector	
Regulatory Approvals	UL, CSA, CB Report, FIMKO, SEMKO, FCC Class B, FDA, CE Marking, C-Tick, CISPR-229, Korean EMC, Taiwan EMC	

Technical Specifications - Removable Storage

1.44-MB Diskette Drive	Diskette Size	3.5 in (8.89 cm)		
	LED Indicators (front panel)	Green		
	Read/Write Capacity per diskette (high/low density)	1.44 MB/720 KB		
	Drive Supported	One		
	Drive Height	One-third		
	Drive Rotation	300 rpm		
	Transfer Rate (high/low)	500/250 Kb/s		
	Bytes/Sector	512		
	Sectors/Track (high/low)	18/9		
	Tracks/Side (high/low)	80/80		
	Access Times	Track-to-Track (high/low)	3/6 ms	
		Average (high/low)	169/94 ms	
		Settling Time	15 ms	
		Latency Average	100 ms	
USB Disk on Key	Dimensions (HxWxD)	0.9 x 0.6 x 3.2 in (2.3 x 1.5 x 8.2 cm)		
	Weight	0.05 lb (0.02 kg)		
	USB Specification	1.1		
	Transfer Rate	Read-1023 KB/Sec; Write-850 KB/Sec		
	Storage Media	Solid state flash memory, no moving parts		
	Power Supply	USB Bus-powered, no external power required		
	Capacity	64 MB and 128 MB		
Zip 250 Drive	Interface	ATAPI IDE		
	Media format supported	Zip disk		
	Media capacity	250 MB		
	Access time	29 ms (average)		
	Drive rotational speed	2,941 rpm		
	Size	Fits into a 5.25-inch bay (with bracket)		
	Data transfer rate	Maximum sustained	2.4 Mbps	
			1.4 Mbps	
			1.4 Mbps (100 MB), 2.4 MB/s (250 MB)	
			0.3 Mbps (100 MB), 2.4 MB/s (250 MB)	
			11.1 Mbps	
	Operating conditions	Temperature	50° to 125° F (10° to 51.5° C)	
		Humidity	20% to 80%	
	Compatible operating system	Microsoft Windows 2000 and Windows NT 4.0		

Technical Specifications - Removable Storage

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